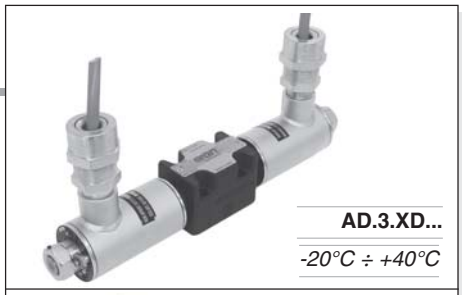


AD.3.XD...

-20°C ÷ +40°C

AD.3.XS...

-30°C ÷ +60°C

AD.3.X*... DIRECTIONAL CONTROLE CETOP 3 IN ACCORDANCE WITH 94/9/CE ATEX DIRECTIVE

ATEX

94/9/CE ATEX EC DIRECTIVE (EXPLOSIVE ATMOSPHERE)

INTRODUCTION

Since 30/06/2003 products introduced into the market (or started-up) inside the EU, destined to be used in potentially explosive environments, must be in compliance with the 94/4/EC Directive through special marking. The directive regarding ATEX products 94/9/EC is therefore the regulation instrument that the European Union uses to obtain legislative harmonisation between the States and guarantee free circulation of goods inside the European Community itself.

The directive affirms that to eliminate obstacles from commerce it is necessary to guarantee a high level of protection and, with this aim, define the essential requirements on the subject of safety and health. The dispositions base themselves on the principle of the “new approach” (NA), for which the essential safety requirements of products must be established depending on the risk evaluation concurrent at the time of their use.

The 94/4/EC Directive is applied to the manufacture specifications of all those products (electrical and not) destined to be used in potentially explosive environments caused, by the dangers deriving from the presence of dust or gas, with the scope of reducing the risk of use that could be derived.

The term **product** refers to appliances, protection systems, devices, components and relative combinations, as defined in 94/9/EC Directive.

The term **appliances** intends machines, materials, fixed or mobile devices, control elements, instruments detection and prevention systems. Alone or combined these are destined for production, transport, deposit, measurement, adjustment and conversion of energy, and to the transformation of material and which, by way of the powerful triggering sources, risk causing an explosion. As a consequence, even intrinsically safe appliances re-enter within the field of application of the directive.

Ther combination of two or more appliance parts, as well as any other components, makes up a whole unit that can be considered a product and therefore re-enters within the field of application of the 94/9/EC Directive. If the whole unit requires adequate **installation** (therefore it is not immediately ready for use) the attached instructions should guarantee maintenance of compliance to the 94/9/EC Directive on installation, without further evaluations of conformity. The installer must follow the instructions correctly.

When a combination of appliances leads to a **plant** this may not re-enter within the field of application of the directive. Each part must be certified and in compliance with the directive (as well as being subject to the relative evaluation of conformity, EC marking, etc.).

The plant manufacturer must therefore presume the conformity of the various components (each supplied with conformity certificate released by the respective manufacturer) and limit their evaluation only to any additional risks that become important in the final combination. Nevertheless, if the plant manufacturer inserts parts without EC marking or components not supplied with the certificate it will be obligatory to carry out further conformity evaluation of the whole unit.

The 94/9/EC Directive envisions **obligations of the person** who introduces products into the market and/or starts them up, whether they are manufacturer’s, his agent’s, importer’s or any other responsible person. The dispositions and obligations envisioned by the directive for **introduction into the market** have been applied, since 30 June 2003, to every individual product, independently from the date and place of manufacture. It is the manufacturers responsibility to guarantee conformity of all products, where these re-enter within the field of application of the directive.

The directive does not govern the use of the appliances; rather it establishes that the products can only be used if in compliance with safety requirements at the time of their introduction into the market or of their start-up. “**Start-up**” means the first use of the products subject of the 94/9/EC Directive on EU territory by a final user. Nevertheless, a product that is immediately ready for use and does not need assembly or installation, and whose distribution conditions (deposit, transport, etc.) are not important for performance, is considered started-up at the time of introduction into the market.

Among the main potential causes/sources of triggering an explosion, such as sparks, flames, electric arcs etc.., **maximum surface temperature** also plays an important role. The dispositions of the directive establish evaluation criteria for the maximum temperature admissible depending on the type of explosive atmosphere in which the appliance must operate.

For environments characterised by the presence of **gas-air**, some temperature values are supplied to which the appliances must refer. They are indicated by the letter T followed by a number. The criterion to apply is that for which the temperature of the appliance must never exceed 80% of the value indicated for its own category.

For environments characterised by the presence of **dust-air**, to prevent setting on fire of the airborne dust, the surface temperature of the appliances must be decidedly lower than the predictable temperature of catching fire of the air+dust mixture. Therefore, during planning the maximum working surface temperature must be declared directly (in degrees centigrade).

Increases in temperature deriving from an accumulation of heat and chemical reactions must also be taken into consideration. The thickness of the deposited layer of dust must also be considered and, if necessary, limit the temperature, to prevent an accumulation of heat.

CLASSIFICATIONS OF AREA - MIX - GROUP AND RELATIVE CATEGORY – ACCORDING TO ATEX DIRECTIVES

The 94/9/EC Directive is a "new approach" directive based on risk analysis. Its objective is to minimise the risks deriving from the use of some products indoors or in relation to a potentially explosive atmosphere. The probability of an explosive atmosphere manifesting must be considered not only as "one-off" or from a static point of view: all operative conditions that can derive from the transformation process must be taken into consideration.

• An **explosive atmosphere** for the 94/9/EC Directive is made up from a mixture of inflammable substances (as gas, vapours, mists and dust), with air, in determined atmospheric conditions in which, after triggering, the combustion propagates together with the unburned mixture.

• An atmosphere susceptible to transforming into an explosive atmosphere because of local and/or operative conditions is defined **potentially explosive atmosphere**.

Explosive atmospheres are not only formed in the presence of obviously dangerous substances such as fuel, solvents etc., but also in the presence of apparently harmless products such as wood dust, metal dusts, flour, grain, sugar etc. Therefore it can concern not only industries in the chemical or oil industry sectors, but also industries in the foodstuffs, textile, manufacturing etc.. It is important to consider that to re-enter within the 94/9/EC Directive a product must be applied in presence of one or more of the characteristic elements listed above: *presence of inflammable substances and air, in atmospheric conditions that favour the propagation of combustion*. The directive does not define the atmospheric conditions itself. The relative norms indicate a temperature range, but this does not exclude that the products may be planned and evaluated specifically to occasionally function outside of this range, introducing the opportune construction transformations.

To define a **conformity evaluation procedure** adequate for the directive, the Manufacturer must, on the basis of the declared use, establish the products functioning conditions (this means to say, envision the type of working area, the type of explosive mixture with which it will come into contact and the level of probability that an explosive atmosphere verifies itself); successively he must establish to which Group the product belongs and individualise the category inside the Group.

With the Atex 99/92/EC Directive (For the safety of workers) the working conditions in which products in compliance with Atex 99/4/EC Directive will function are indicated here. These are expressed in **"Areas"** and defined according to the level of probability that a potentially explosive atmosphere is verified, respectively for every type of atmosphere (gas-air mix or dust-air mix).

Area 0 and 20 Places in which an explosive atmosphere is constantly present or present for long periods or frequently.

Area 1 and 21 Places in which an explosive atmosphere is probable. It is verified in normal functioning and exercise conditions.

Area 2 and 22 Places in which an explosive atmosphere has low probability of being verified or, if it occurs only lasts for a brief period of time.

GAS-AIR-TYPE EXPLOSIVE MIXTURE (G)

The products destined to work in environments characterised by this type of explosive atmosphere will be respectively indicated for Area **0, 1 or 2** depending on the Group and category of origin (see below) and are marked with the letter G.

DUST-AIR-TYPE EXPLOSIVE MIXTURE (D)

The products destined to work in environments characterised by this type of explosive atmosphere will be respectively indicated for Area **20, 21 or 22** depending on the Group and category of origin (see below) and are marked with the letter D.

GROUP I

Includes the appliances destined to be used in underground jobs in the mines and their surface plants, exposed to the risk of the release of firedamp and/or combustible dust. The subdivision into categories depends on the fact if the power supply must be interrupted or not if an explosive atmosphere manifests due to a mixture of air and gas, vapours mists (D) or a mixture of air and dust (G).

Category **M1** **Very high protection level.** These products must be able to remain operative, for safety reasons, in the presence of an explosive atmosphere and present specific performances or protection configurations for breakdown in case of explosion.

Category **M2** **High protection level.** The power supply to these products must be interrupted in the presence of an explosive atmosphere. Protection means must be incorporated to guarantee the level of protection during normal functioning and also in oppressive working conditions or resulting from great stressi.

GROUP II

Includes appliances destined to be used in different environments (from the mines) in which there is a probability that an explosive atmosphere manifests itself. Their subdivision into categories depends on two factors: the place, where the product will be used and if the probability that a potentially explosive atmosphere, owing to the mixture of air and gas, vapours, mists (D) and the mixture of air and dust (G), comes about in a constant or occasional manner and if it does occur, does this possibility remain for long or brief period of time.

Category 1 **Very high protection level.** These products must be planned to function in compliance with operative parameters established by the Manufacturer in environments in which there is a high probability that explosive atmospheres are always detected or manifest often or for long periods of time. They must present specific performances or protection configurations for breakdown in case of explosion.

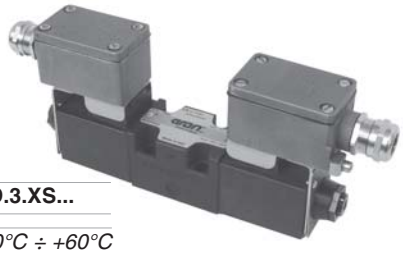
Category 2 **High protection level.** These products must be planned to function in compliance with operative parameters established by the Manufacturer in environments in which there is a high probability that explosive atmospheres can manifest. Protection against explosions relative to this category must function in a way to guarantee the required safety level even in the presence of functioning defects of the appliances or in dangerous operative conditions, which frequently must be taken into consideration.

Category 3 **Normal protection level.** These products must be planned to function in compliance with operative parameters established by the Manufacturer in environments in which there is a slight probability that explosive atmospheres can manifest, and however only rarely or for a brief period of time. This type of product belonging to the category in question must guarantee the safety level required in normal functioning conditions.

AD.3.X*... DIRECTIONAL CONTROLE CETOP 3 IN ACCORDANCE WITH 94/9/CE ATEX DIRECTIVE

AD.3.XD...

-20°C ÷ +40°C



AD.3.XS...

-30°C ÷ +60°C

VALVES SUITABLE FOR APPLICATIONS IN ZONES WHERE EXPLOSIVE ATMOSPHERE MAY OCCUR, AND ALSO ZONES CHARACTERIZED BY THE PRESENCE OF GAS MIXTURES

The AD3.X* valve series are **Group II** appliances (destined to be used in environments, apart from mines, where there is the probability of explosive atmospheres) **category 2** (high protection level), for use in **Zones 1 and 2** (places where it is probable that an explosive atmosphere forms in normal working conditions) and classified by the presence of gas-air type explosive mixtures, vapours and mists (letter **G**). We are therefore, talking about specially designed valves that are realised in compliance with the ATEX 94/9/EC Directive and according to European regulations EN 1127-1, EN 13463-1 and EN 13463-5.

Going back to Aron's "NG06 direction control" range, these valves are prepared for plate-mounting with attachment surface in compliance with UNI ISO 4401 - 03 - 02 - 0 - 94 (ex CETOP R 35 H 4.2-4-03). Activation is electrical and the centre position is obtained using springs with calibrated lengths, which once the impulse or command action has ceased, re-position the cursor in the centre or at the end run.

The coils used for these valves are subject to separate conformity certification, according to the ATEX Directive (EC-type). Suitable for use in zones 1 and 2, these coils are suitable for functioning in presence of gas (group IIC) and offer construction-type protection safety, respectively initialled "EEx d IIC T5 for the AD3XD" valve and "EEx me II T4 for the AD3XS" valve.

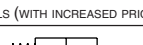
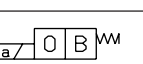
Before marking and issue onto the market, the valves of the AD3.XD / AD3.XS series undergo controls and inspections as envisioned by the internal Manufacturing System and as envisioned by the Certified Company Quality System in compliance with ISO 9001 regulations according to Vision 2000. All of the AD3.XD and AD3.XS valve series undergo100% functional inspections. These controls guarantee that the products sold are in compliance with all reported in the Technical Specifications File deposited and declared by marking with AD3X/ATEX/04.

TECHNICAL SPECIFICATIONS	AD.3.XD...	AD.3.XS...
Valve marking	CE Ex II 2 G cT5	CE Ex II 2 G cT4
Max. operating pressure ports P/A/B	320 bar	320 bar
Max. pressure port T (dynamic)	250 bar	70 bar
Max. flow	60 l/min	60 l/min
Max. excitation frequency	3 Hz	3 Hz
Duty cycle	100%ED	100%ED
Hydraulic fluid	mineral oil DIN 51524	mineral oil DIN 51524
Fluid viscosity	10 ÷ 500 mm^2/s	10 ÷ 500 mm^2/s
Fluid temperature	**-20°C ÷ +40°C**	**-30°C ÷ +60°C**
Ambient temperature	**-20°C ÷ +40°C**	**-30°C ÷ +60°C**
Max. contamination level	class 10 with NAS 1638 with filter $ß_{25}≥75$	class 10 with NAS 1638 with filter $ß_{25}≥75$
Weight (with one solenoid)	2,37 Kg	2,10 Kg
Weight (with two solenoids)	3,82 Kg	3,40 Kg
Coil rated power	11-13 W	
Degree of protection	IP 67	IP 66
Supply tolerance	±10%	-10% ÷ 0%
Supply cable	standard length 3m with cable gland	Cable gland in accordance with Atex for cable type Ø external = 7÷ 12 mm
Solenoid marking	CE 0722 Ex II 2 G EEx d IIC T5 W11 - CESI 03 ATEX 212	Ex CE 1180 II 2 G EEx me II T4 BASEEFA02AATEX0199X
Connector marking	EEx d II C KEMA 01 Atex X2240X	EEx e II KEMA 99 Atex 6971

ORDERING CODE

AD	Directional control valve
3	CETOP 3/NG06
X*	Solenoid valve in accordance with 94/9/CE Atex Directive **D =** with performed explosion proof solenoids (EEx d) **S =** with performed icreased safety solenoids (EEx me)
******	Spool **01/02/03/04/16** (see sideways) For different spools, please conctat Aron Customer Service
*****	Mounting **C / E / F / G / H** (tab.1) For different mounting, please conctat Aron Customer Service
*****	Voltages (tab.2)
******	Variants **00 =** No variants **V1** = Viton (for AD3XD only)
1	Serial No.

TAB.1 MOUNTING

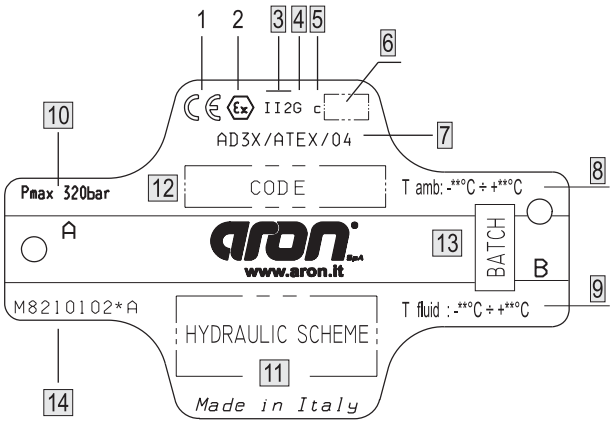
STANDARD	
C	
E	
F	
SPECIALS (WITH INCREASED PRICE)	
G	
H	

TAB. 2 - VOLTAGES

AC VOLTAGE	FOR AD3XD	FOR AD3XS
A	24/50Hz	24/50Hz
B*	/	48/50Hz
C	110V/50Hz	/
J	/	115V/50Hz
D	220V/50Hz	/
I	230V/50Hz	230V/50Hz
DC VOLTAGE	**FOR AD3XD**	**FOR AD3XS**
L	12V	12V
M	24V	24V
P*	110V	/
N	48V	/
(*) Special voltage	Voltage code is always stamped on the plate of the AD3X* valve	

VALVE MARKING

REGISTRED MARK AND IDENTIFICATION PLATE FOR AD3X*... SOLENOID VALVES IN ACCORDANCE WITH ATEX DIRECTIVE



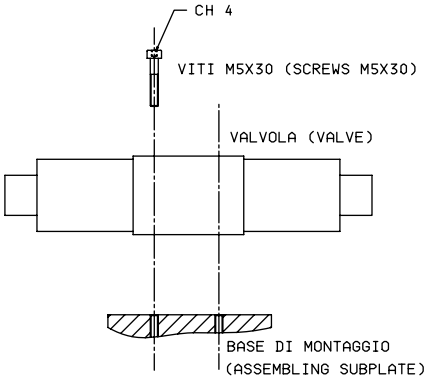
1	CE	In accordance with Europe Directive
2	Ex	In accordance with Atex 94/9/CE Directive
3	**II 2**	Group II (surface places) Class 2 (high degree of protection)
4	**G**	Explosive atmosphere which is comprised of gas, vapours or mist
5	**c**	safety performed
6	**T*** series AD3XD series AD3XS	Class of temperature T5 (<100) T4 (< 135)
7	**AD3X/ATEX/04**	Reference of the Technical issue put down at the Notifying Body

8	**T amb** series AD3XD series AD3XS	Operating ambient temperature - 20°C ÷ + 40°C - 30°C ÷ + 60°C
9	**T fluid** series AD3XD series AD3XS	Operating fluid temperature - 20°C ÷ + 40°C - 30°C ÷ + 60°C
10	**Pmax 320 bar**	Max. operating pressure
11	**HYDRAULIC SCHEME**	Hydraulic scheme of the valve
12	**CODE**	Complete reference number of the valve's ordering code
13	**BATCH**	Reference number of the technical ordering code (batch)
14	**M8210102*A**	Plate code

Every solenoid valve is supply with its **"Identification Plate"** and with the **"Declaration of Conformity"** in accordance with the 94/4/CE Atex Directive.

The identification plate shows the most important technical perfomance and constructive specifications so **it has to be always integral and visible.**

DAMAGING SUBSTANCE AND ZONE	CLASS (94/9/CE DIRECTIVE)
Gas, vapours or mist **Zone 0**	1G
Gas, vapours or mist **Zone 1**	2G or 1G
Gas, vapours or mist **Zone 2**	3G, 2G or 1G



EXAMPLE OF A CORRECT INSTALLATION

INSTRUCTIONS FOR A CORRECT INSTALLATION

1 Assemble the valve on the mounting base using 4 - M5x30 UNI5931 screw fasteners in class 8.8 minimum material with tightening torque of 5 Nm. Surface features: roughness Ra < 1.6 and planarity 0.03mm max.

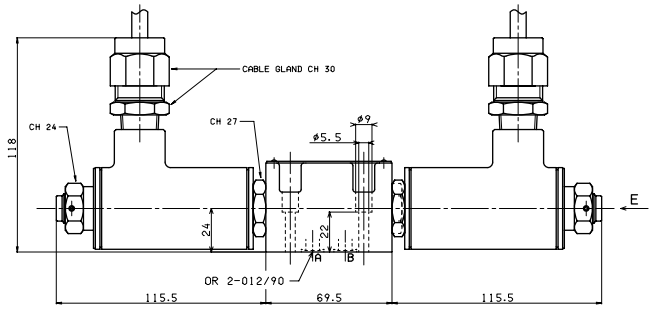
2 Carry out wiring of the solenoids according to the user instructions of the relative coils (a copy is always supplied with each solenoid).

- The valves must be connected to earth using the special anti-loosening and anti-rotation connection element.
- When mounting the valve onto the base (manifold) ensure not to damage the OR sealing rings on the surface.
- For the aspects tied to the installation of the solenoids, see the relative safety instructions. The electrical components must not be opened when live.
- If it is necessary to loosen the ring nuts on the external ends of the coil to opportunely position the cable-holders, they must be tightened again to the respective tightening torques.

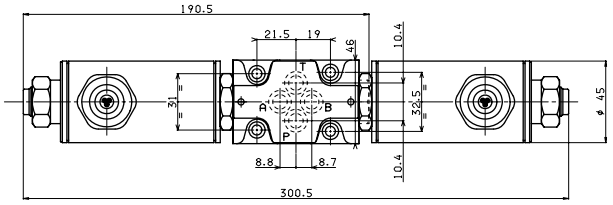
Tightening torque ring nut/coil (Ch. 24) for series AD3XD = 25 ± 2Nm
Tightening torque ring nut/coil (Ch. 22) for series AD3XS = 19 ± 1Nm

OVERALL DIMENSIONS

AD.3.XD... SOLENOID VALVES EQUIPPED WITH EXPLOSION PROOF COILS SUITABLE FOR APPLICATIONS IN ZONES WHERE EXPLOSIVE ATMOSPHERE MAY OCCUR (GAS MIXTURES)

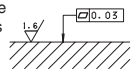


E = Manual override

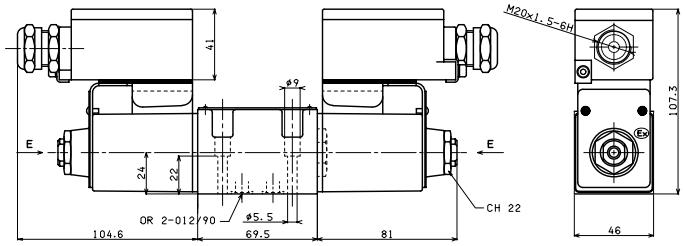


Fixing screws UNI 5931 M5x30
with material specifications min. 8.8
Tightening torque 5 Nm / 0.5 Kgm

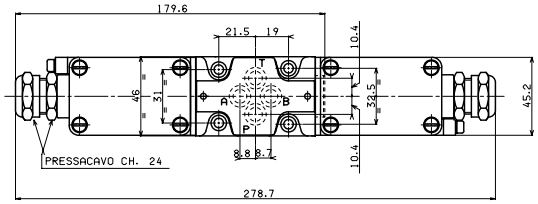
Support plane specifications



AD.3.XS... SOLENOID VALVES EQUIPPED WITH INCREASED SAFETY COILS SUITABLE FOR APPLICATIONS IN ZONES WHERE EXPLOSIVE ATMOSPHERE MAY OCCUR (GAS MIXTURES)

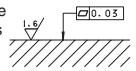


E = Manual override



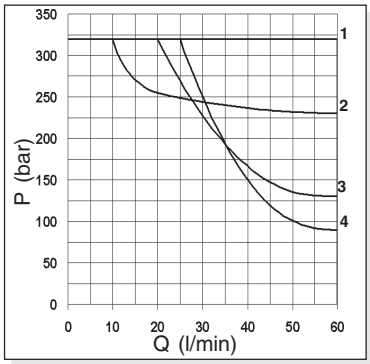
Fixing screws UNI 5931 M5x30
with material specifications min. 8.8
Tightening torque 5 Nm / 0.5 Kgm

Support plane specifications

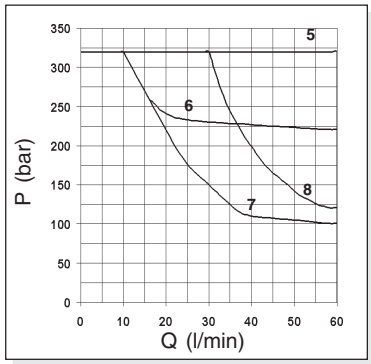


LIMITS OF USE

AD.3.XD...



AD.3.XS...



Spool type	Curve AD3XD
01	2
02	1
03	3
04	4
16	1
	AD3XS
01	6
02	5
03	7
04	8
16	5

The tests have been carried out with solenoids at operating temperature with a voltage 10% less than rated voltage with a fluid temperature of 40°C. The fluid used was a mineral oil with a viscosity of 46 mm^2/s at 40°C. The values in the diagram refers to tests carried out with the oil flow in two direction simultaneously (e.g.. from P to A and in the same time B to T).
In cases where valves 4/2 e 4/3 were used with the flow in one direction only, the limits of use could have variations which may even be negative.

SAFETY INSTRUCTIONS

- ***Carefully read everything reported in the instruction sheet attached to the valves, before installation. All maintenance operations must be performed according to the manual.***
- The AD3.XD and AD3.XS series valves must be installed and maintained in compliance with plant and maintenance regulations for environments classified against the risk of explosion because of presence of gas (for example: EN 60079-14, EN 60079-17 or other national regulations/standards).
- The valves must be connected to earth using the special anti-loosening and anti-rotation connection element.
- For all safety aspects tied to the use of the coil see the relative use and maintenance instructions. The electrical appliances/components must not be opened when live.
- The user must periodically control, depending on the conditions of use and the substances used, the presence of deposits, cleaning, wear and correct functioning of the valves.

Attention: all installation and maintenance interventions must be performed by qualified staff.

INSTRUCTIONS FOR A CORRECT USE AND MAINTENANCE

USE:
- Respect functional limits indicated in the *technical features* section and those, where restrictive, indicated in the solenoid safety instructions.
- The oil used must be within the types envisioned by the manufacturer and its contamination level must be maintained within the indicated limits.

MAINTENANCE:
- The user must periodically control, depending on the conditions of use and the substances used, the presence of deposits, cleaning, wear and correct functioning of the valves.
- If the OR sealing rings are damaged, only replace them with those specifically supplied by the manufacturer.

EXAMPLE OF THE DECLARATION OF CONFORMITY

aron S.p.A	*Dichiarazione di conformità* *Declaration of conformity*

Noi **Aron S.p.a**
We **Via G. Natta, 1**
42100 Reggio Emilia (RE)

dichiariamo sotto la nostra esclusiva responsabilità che il prodotto:
declare under our sole responsibility that the product:

Valvole serie AD3.XD/ AD3.XS
Valves series AD3.XD/ AD3.XS

al quale questa dichiarazione si riferisce è conforme alla seguente direttiva:
to which this declaration relates complies with the following Directives:

- **ATEX Directive 94/9/EC**

La conformità è stata verificata sulla base dei requisiti delle norme o dei documenti normativi riportati nel seguito:
The conformity are under observance of the following standards or standards documents:

- EN 1127-1
- EN 13463-1
- EN 13463-5

Marcatura / marking

Valvole serie AD3.XD: CE Ex **II 2 G c T5, T6**

Valvole serie AD3.XS: CE Ex **II 2 G c T4, T5 Tamb. - 30°C ÷ + 60°C**

Fascicolo tecnico: ***AD3X/ATEX/04***
Technical issue

Organismo Notificato di deposito del fascicolo tecnico:
The documents required will archive at the following location:

INERIS *– BP2 60550 VERNEUIL EN HALATTE - FRANCE*
Notified body Atmosphere explosives.
Reference No. 17487/04

Reggio Emilia (RE), *dated 03.06.04* *Signature*